REMARKS/ARGUMENTS

Claims 1-8, 10-24, 29 and 31-33 are pending in the application. Claims 1-8, 10-24, 29 and 31-33 are rejected. Claims 1, 10 and 31-32 have been amended. No new matter has been added. In view of the foregoing amendments and the following remarks, Applicants respectfully request allowance of the application.

All claims stand rejected as obvious over prior art. Specifically, claims 1, 5, 10-13, 18-22, 29 and 32-33 stand rejected as obvious over Lee, et al. ,"Temporally Adaptive Interpolation Exploiting Temporal Masking in Visual Perception," and Tourapis, et al. (US Patent Application Publication 2003/0142748 A1). Claims 2, 6-8 and 17 are rejected as obvious over Lee in view of Tourapis and Lan et al., "Scene-Context Dependent Reference Frame Placement for MPEG Video Coding." Claims 3, 4, 14 and 23 are rejected as obvious over Lee, Tourapis and Liu et al., (US Patent Application Publication 2002/0146071 A1). Claims 15 and 24 are rejected as obvious over Lee, Tourapis and Mitchell, "MPEG Video Compression Standard." Claim 16 was rejected as obvious over Lee, Tourapis and Ohm, "Digitale Bildcodierung." Claim 31 was rejected under 35 U.S.C. § 103(a) as obvious over Tourapis in view of Ardizzone et al., "Video Indexing Using MPEG Motion Compensation Vectors." Applicants respectfully request withdrawal of the outstanding rejections.

CLAIMS 1-8, 10-24, 29, AND 31-33 DEFINE OVER THE PRIOR ART

Claims 1, 5, 10-13, 18-22, 29, and 32-33 are rejected as obvious over Lee in view of Tourapis. The remaining claims stand rejected as obvious over Lee, Tourapis and various other supplemental references. Applicants respectfully request withdrawal of the outstanding rejections because the cited art, even if considered in combination, do not teach or suggest every element of independent claims 1, 10, 18, 29, and 33.

Consider claim 1, which states:

> ***determining a motion speed*** for each picture of the plurality of pictures in temporal order ***based on the computed motion vectors*** for each respective picture,
> ***comparing the motion speed of a first picture in the plurality***, temporally closest to the reference picture, ***to the motion speeds of each of the other pictures therein***, and

> for each picture in the plurality of pictures exhibiting motion speed consistent with the first picture, assigning such pictures as B pictures.

The cited art does not teach or suggest this subject matter. No reference teaches or suggests either 1) comparing motion speed of a first picture following the reference picture to motion speeds of the other pictures, or 2) determining a motion speed of a picture from the picture's motion vectors.

The Cited Art does not Disclose Comparing Motion Speeds Among Pictures

With respect to the comparing step (no. 1 above), the Office Action considers this subject matter to be disclosed inherently by Lee's discussion of temporal segmentation based on motion compensation estimation at p. 519, col. 1. An inherency rejection is appropriate only if the prior art's disclosure necessarily includes the omitted feature; if there are multiple ways of accomplishing a given function, inherency is not present. (MPEP § 2112(IV)).

Lee's discussion on p. 519 refers to a comparison among frames. The motion compensation error refers to an error that occurs between a source image f_m and a decoded replica of the source image $\hat{f}_m$. Lee states:

> Since coding difficulty is determined by the error between f_m and $\hat{f}_m$, which is a prediction from f_n, ***this motion compensation error can provide a difficulty measure for the coding of the error image*** between f_m and $\hat{f}_m$. Hence, the distance measure using this error is defined by
>
> $$D(f_n, f_m) = \sum_{all(i,j)} \left| f_m(i,j) = \hat{f}_m(i,j) \right|$$
>
> where (i,j) is the pixel position.

(Lee, p. 519). (emphasis added). Although Lee's system likely does use motion vectors[1] to derive a decoded picture $\hat{f}_m$, this does not inherently disclose the subject matter of claim 1. Lee is comparing a source image f_m (which has no motion vectors, it is source data) with a

[1]The difference between motion vectors and motion speed are discussed herein below.

decoded image $\hat{f}_m$. Claim 1 refers to a comparison of picture motion between different pictures in a sequence of video data, specifically between the first picture following a reference picture and a plurality of other pictures thereafter.

Lee's disclosure at p. 515 gets no closer to the recitation of claim 1. At p. 515, Lee refers to two types of detectors – one using an abrupt scene change (which the Office has not used in its rejection) and the other finding scene segmentation points (SSPs). Lee states that:

> An SSP corresponds to a point where small changes of scene such as slow panning or zooming ***have accumulated over several frames*** to exceed a distance measure threshold. This detector declares the current frame as an SSP when the distance measure between the current frame and the last reference frame is above a threshold.

Lee's system is based on accumulation – motion is summed over a number of frames and an SSP is declared when the sum exceeds a threshold. Lee does not state anywhere that a motion speed of a first picture is compared against motion speeds of other pictures. Lee simply does not meet the substance of this claim element.

Tourapis does not disclose this subject matter either. Tourapis refers to direct mode prediction, which the Office has assumed requires performance of the method recited in claim 1. In this manner, although the Office's analysis does not expressly acknowledge it, the Office has made another inherency argument. Certainly, the Office has cited to no portion of Tourapis that expressly discloses comparison of picture motion speeds. Therefore, the Office must assume that Tourapis inherently performs the method of claim 1. This analysis also is incorrect.

Direct mode prediction permits motion vectors of a B frame to be derived from a motion vector of a P frame. Tourapis's disclosure is limited to the macroblock level (¶ 67 – discusses a new macroblock type) and also to the pixel level (¶ 70). He has no disclosure that refers to motion speed of pictures, which have been derived from a plurality of motion vectors.

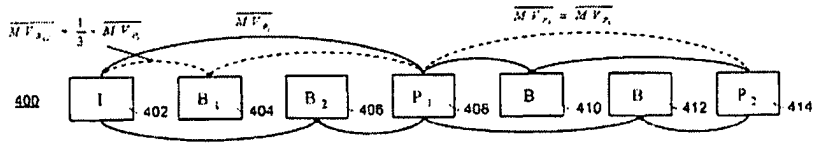

Fig. 4

Further, Tourapis does not disclose a comparison of motion speeds between ***a first picture temporally closest to the reference picture*** and each of the other pictures in a sequence. Tourapis's disclosure at ¶ 67 demonstrates that the system uses the motion vector from I frame 402 to P frame 408 as the reference for the B frames 404, 406. The P frame 408 is not temporally closest to the I frame 402 and yet, under the Office's theory, it is used to determine motion speed. The Office's analysis does not demonstrate that claim 1 is invalid.

The Cited Art does not Disclose Motion Speeds of Pictures.

As noted above, claim 1 recites

> determining a motion speed for each picture based on the computed motion vectors for each respective picture.

By this express claim language, each picture has a motion speed which is computed from a plurality of motion vectors. The Office Action nowhere shows where the art discloses this subject matter. It refers to motion vectors in its discussion of Lee. It cites to ¶¶ 67-68 of Tourapis, which refers exclusively to motion vectors of macroblocks. No reference has any disclosure that states a motion speed for a picture is calculated from a plurality of the picture's motion vectors. This is a second basis on which the outstanding obviousness rejections should be withdrawn.

claim 32 defines over the prior art

Currently amended claim 32 recites:

> The video coding assignment method of claim 29, wherein consistency of motion speed is based on:
>
> $$E(n) = \sum_{1}^{N_{blocks}} \frac{|e(n,b)|}{N_{blocks}}$$, wherein
>
> E(n) represents the mean of the absolute values of the speed errors of a picture, e(n,b) represents a difference of motion vector displacements of a pixelblock b of the picture with respect to the first picture, each scaled according to its temporal distance from the reference picture, and N_{blocks} represents the number of pixelblocks in the picture.

The combination of Lee and Tourapis does not teach or suggest the elements recited in currently amended claim 32. The Examiner's entire rejection of this claim is as follows: "[I]n

Tourapis et al., direct mode blocks have directly temporally scaled motion vectors (paragraphs 0118-0119)." (Office Action dated Aug. 21, 2008, pg. 7). Applicants fail to see within the cited paragraphs any discussion of the equation recited in claim 32. Specifically, Applicants can find no teaching or suggestion of determining the mean of the absolute speed errors of a picture, or of a representation of a difference of motion vector displacements with respect to the first picture.

Because the combination of Lee and Tourapis does not teach or suggest the above limitations, the combination does not render claim 32 obvious under § 103. Therefore, Applicants respectfully request withdrawal of the rejection as to all pending claims.

CONCLUSION

In view of the above amendments and arguments, it is believed that the above-identified application is in condition for allowance, and notice to that effect is respectfully requested. Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at (408)975-7500.

The Commissioner is authorized to charge any fees or credit any overpayments which may be incurred in connection with this paper under 37 C.F.R. §§ 1.16 or 1.17 to Deposit Account No. **11-0600**.

Respectfully submitted,

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